Amendments to the Claims:

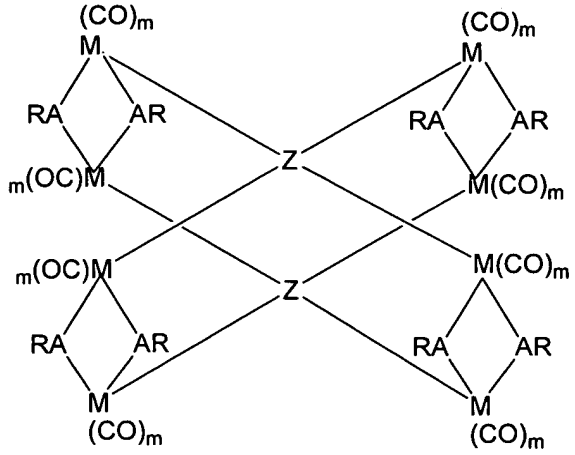
This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1-22. (Cancelled)

a'

23. (Currently Amended) A tetragonal prismatic supramolecule having the following structure:



wherein

M is Re, Mn, Cr, Mo, W, Fe, Ru, or Os,

Z is a nitrogen-based tetradentate ligand;

A is O, S, Se, or Te;

R is C_1~C_{16} alkyl, $(CH_2)_n$-aryl, or $(CH_2)_n$-aryl-$(O\text{-}C_1\sim C_{16}\ \text{alkyl})_p$, in which n is 0-15, p is 1-3; and

m is 1, 2, 3, or 4[[, or 5]].

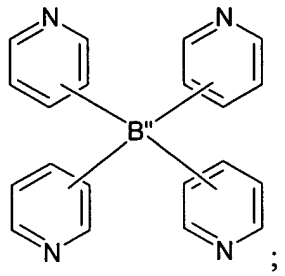
24. (Original) The tetragonal prismatic supramolecule of claim 23, wherein M is Re.

25. (Original) The tetragonal prismatic supramolecule of claim 24, wherein m is 3.

26. (Original) The tetragonal prismatic supramolecule of claim 23, wherein R is C_1~C_{16} straight chain alkyl.

a1 27. (Original) The tetragonal prismatic supramolecule of claim 23, wherein A is O.

28. (Currently Amended) The tetragonal prismatic supramolecule of claim 23, wherein Z is ~~tetrazine or~~ a ligand of the formula:



;

wherein B" is alkyl, alkenyl, alknyl, cyclyl, heterocyclyl, aryl, or heteroaryl.

29. (Original) The tetragonal prismatic supramolecule of claim 28, wherein B" is alkenyl, alknyl, or aryl.

30. (Original) The tetragonal prismatic supramolecule of claim 29, wherein Z is 1,2,4,5-tetraethynyl(4-pyridyl)benzene.

31. (Original) The tetragonal prismatic supramolecule of claim 28, wherein M is Re.

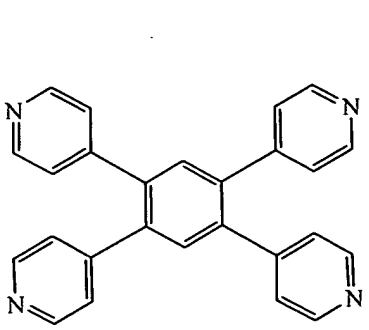
32. (Original) The tetragonal prismatic supramolecule of claim 28, wherein m is 3.

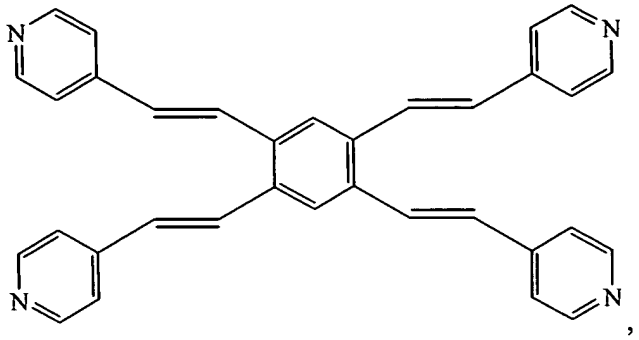
33. (Original) The tetragonal prismatic supramolecule of claim 28, wherein R is C_1~C_{16} straight chain alkyl.

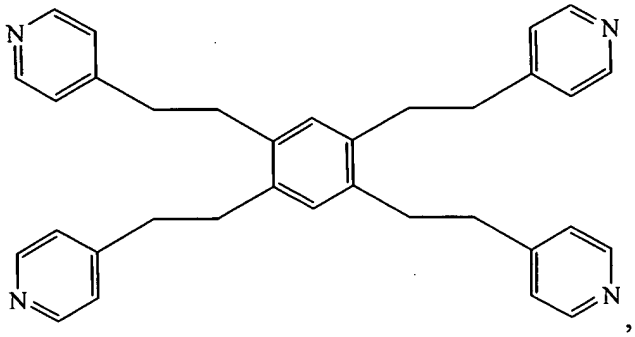
34. (Original) The tetragonal prismatic supramolecule of claim 28, wherein A is O.

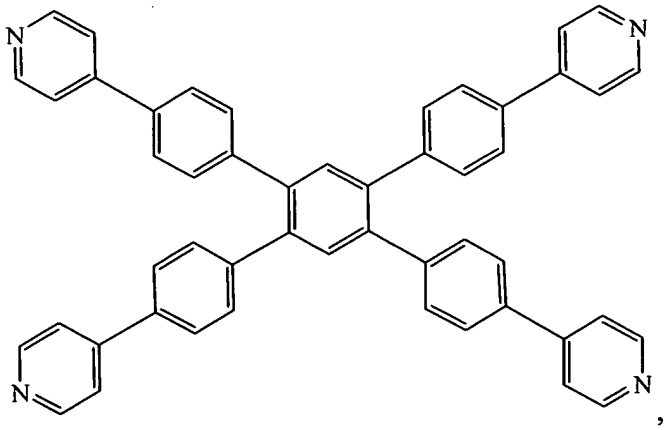
35. (Original) The tetragonal prismatic supramolecule of claim 28, wherein Z is

a'

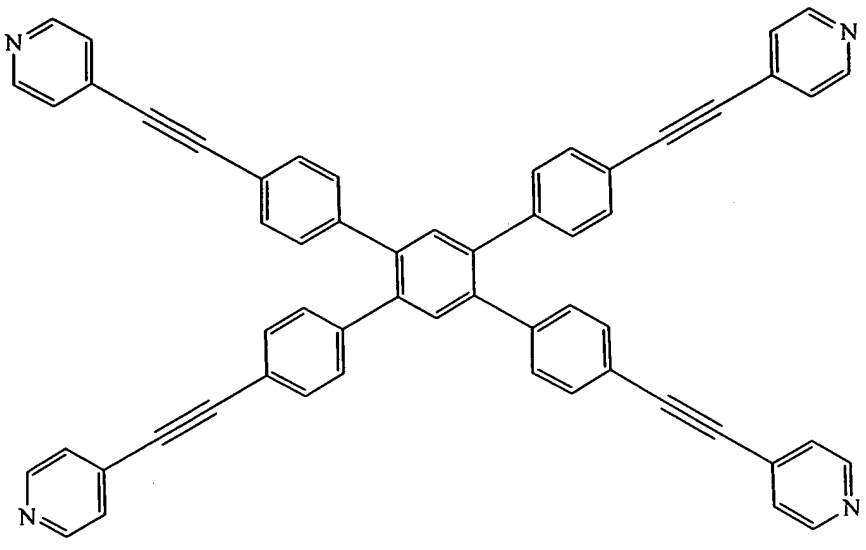




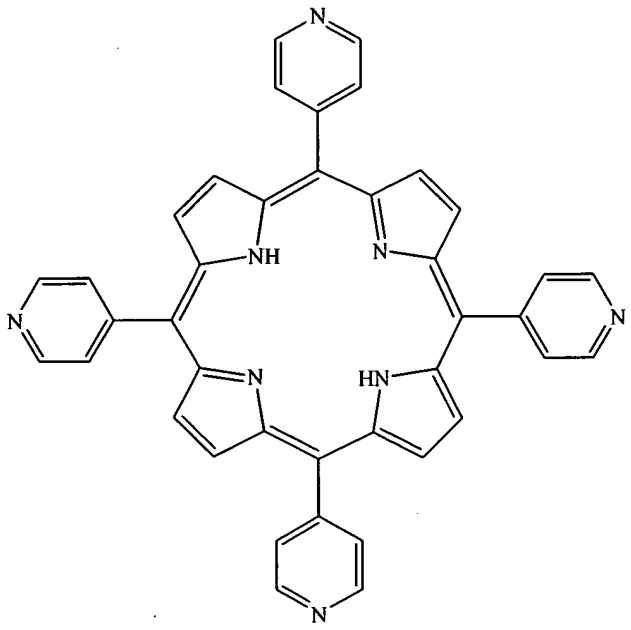




a'



, or



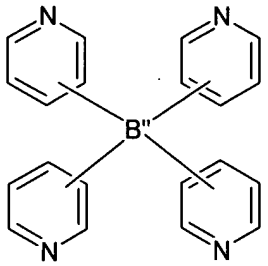
36. (Original) A method for making a tetragonal prismatic supramolecule of claim 23, the method comprising reacting $M(CO)_{m+2}$ with a nitrogen-based tetradentate ligand in the presence of an RAH at an elevated temperature to form the prismatic supramolecule, wherein M, m, R, and A are as defined in claim 23.

37. (Original) The method of claim 36, wherein M is Re and m is 3.

38. (Original) The method of claim 36, wherein RAH is a C_1~C_{16} aliphatic alcohol.

a'

39. (Currently Amended) The method of claim 36, wherein Z is ~~tetrazine or~~ a ligand of the formula:



wherein B" is alkyl, alkenyl, alknyl, cyclyl, heterocyclyl, aryl, or heteroaryl.

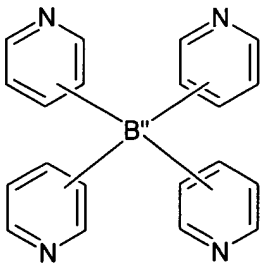
40. (Original) A composition for emitting luminescence at room temperature, comprising: a tetragonal prismatic supramolecule of claim 23 and a solution.

41. (Original) The composition of claim 40, wherein M is Re and m is 3.

42. (Original) The composition of claim 40, wherein R is a C_1~C_{16} aliphatic alkyl.

43. (Original) The composition of claim 40, wherein A is O.

44. (Currently Amended) The composition of claim 40, wherein Z is ~~tetrazine or~~ a ligand of the formula:

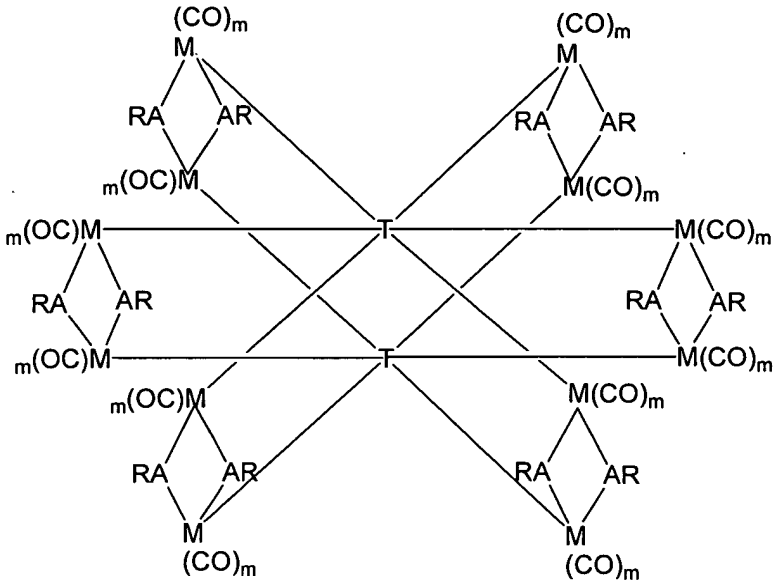


wherein B" is alkyl, alkenyl, alknyl, cyclyl, heterocyclyl, aryl, or heteroaryl.

45. (Currently Amended) The composition of claim 40, wherein the solution is an organic or aqueous solution.

a'

46. (Currently Amended) A hexagonal prismatic supramolecule having the following structure:



wherein

M is Re, Mn, Cr, Mo, W, Fe, Ru, or Os,

T is a nitrogen-based hexadentate ligand;

A is O, S, Se, or Te;

R is C_1~C_{16} alkyl, $(CH_2)_n$-aryl, or $(CH_2)_n$-aryl-$(O\text{-}C_1\sim C_{16}$ alkyl$)_p$, in which n is 0-15, p is 1-3; and

m is 1, 2, 3, or 4[[, or 5]].

47. (Original) The hexagonal prismatic supramolecule of claim 46, wherein M is Re.

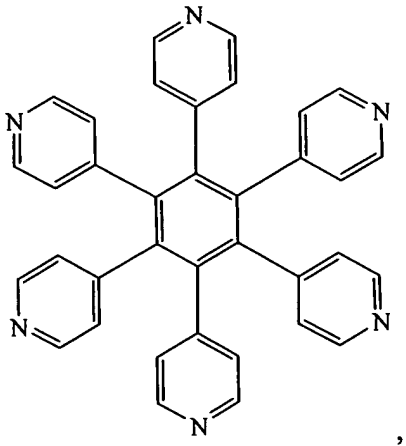
48. (Original) The hexagonal prismatic supramolecule of claim 47, wherein m is 3.

49. (Original) The hexagonal prismatic supramolecule of claim 46, wherein R is C_1~C_{16} straight chain alkyl.

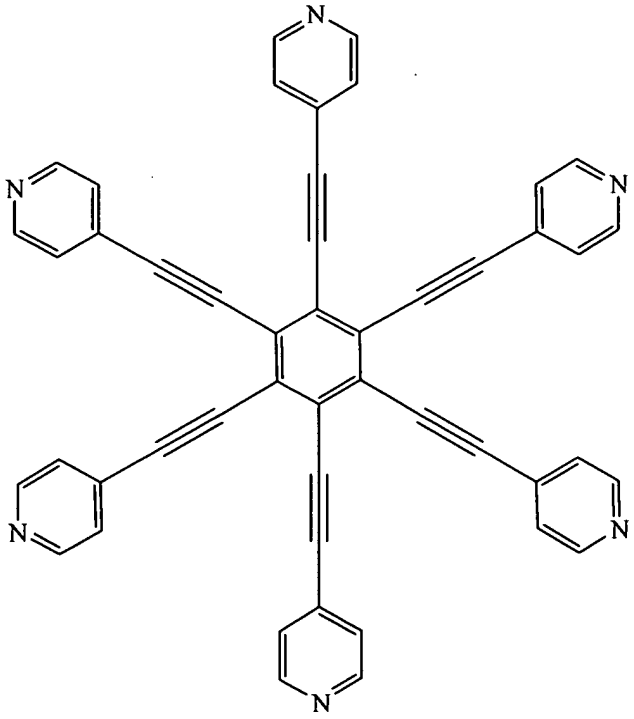
50. (Original) The hexagonal prismatic supramolecule of claim 46, wherein A is O.

51. (Original) The hexagonal prismatic supramolecule of claim 46, wherein T is

a'

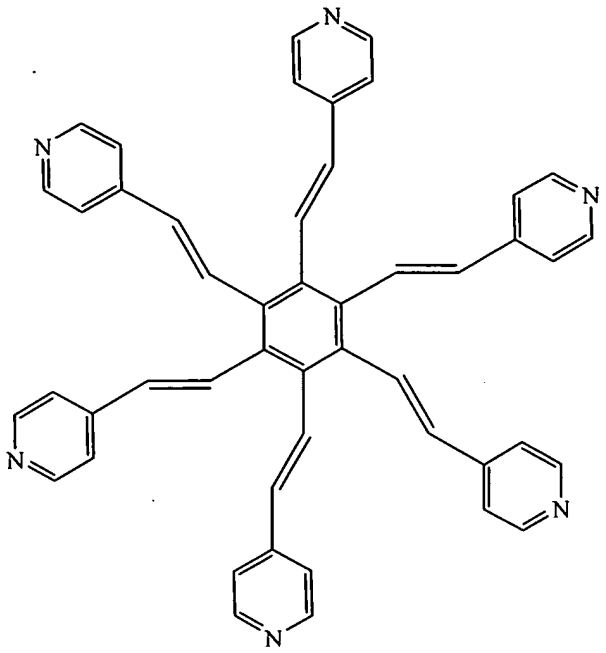


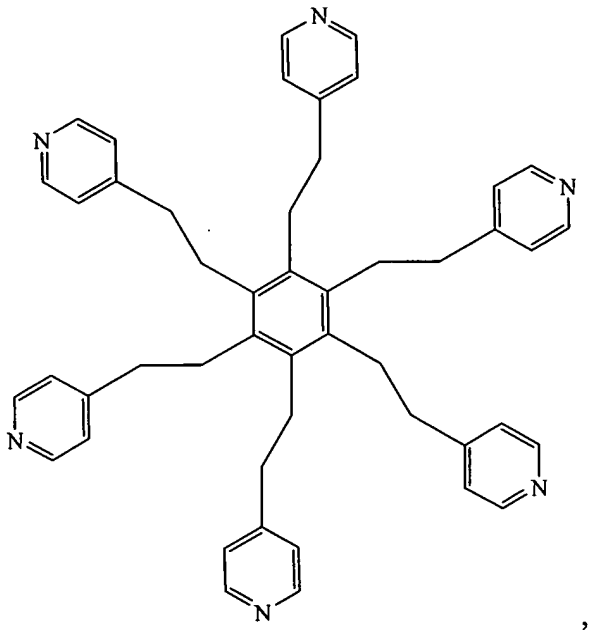
,



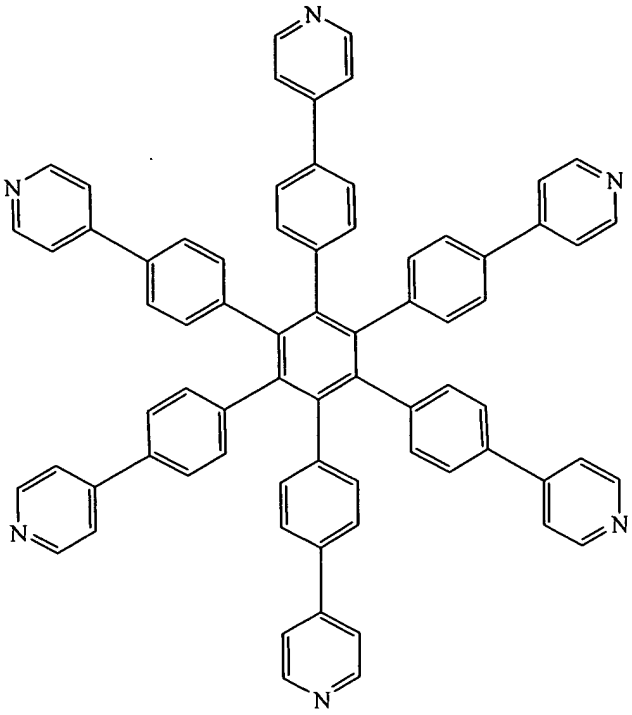
,

a'

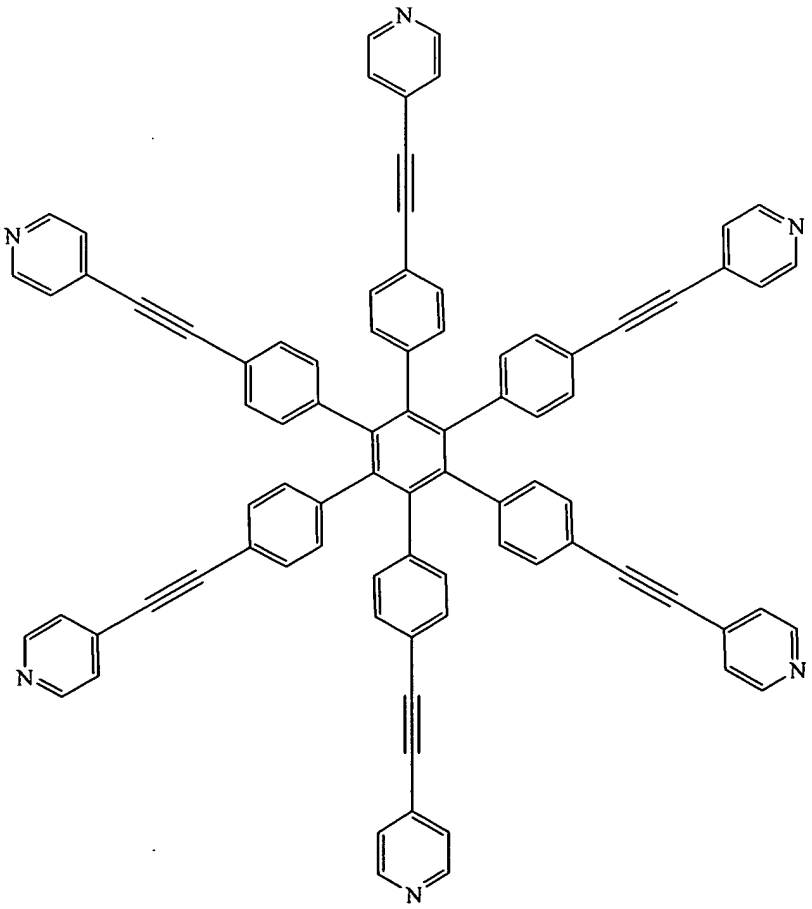




a'



, or



52. (Original) A method for making a hexagonal prismatic supramolecule of claim 46, the method comprising reacting $M(CO)_{m+2}$ with a nitrogen-based hexadentate ligand in the presence of an RAH at an elevated temperature to form the hexagonal prismatic supramolecule, wherein M, m, R, and A are as defined in claim 46.

53. (Original) The method of claim 52, wherein M is Re and m is 3.

54. (Original) The method of claim 52, wherein RAH is a C_1~C_{16} aliphatic alcohol.